

201-14712



Product Safety and Regulatory Affairs

August 27, 2003

Marianne L. Horinko
Acting Administrator
U.S. Environmental Protection Agency
P.O. Box 1473
Merrifield, VA 22116

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Attn: Chemical Right-To-Know Program

Dear Administrator Horinko,

Crompton Corporation is submitting the enclosed Robust Summary and Test plan for the following chemical:

4,4'-oxydi(benzenesulphonohydrazide) (CAS # 80-51-3).

If you have any questions, please contact me at 203-573-3390 or e-mail to mark_thomson@cromptoncorp.com

Sincerely,

Dr. Mark A. Thomson
Manager, Toxicology & International Product Registration
Crompton Corporation
Middlebury, CT 06749
USA



Crompton Corporation 199 Benson Road, Middlebury, CT 06749

**HIGH PRODUCTION VOLUME (HPV)
CHEMICAL CHALLENGE PROGRAM**

TEST PLAN

For

4,4'-oxydibenzenesulfonohydrazide,

CAS No. 80-51-3

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Submitted to the US EPA

By

Crompton Corporation

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Test Plan for 4,4'-oxydibenzenesulfonohydrazide

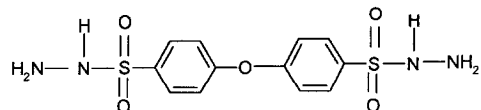
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1. General Information

1.1 CAS Number: 80-51-3

1.2 Molecular Weight: 358.39

1.3 Structure and formula: C₁₂H₁₄N₄O₅S₂



1.4 Introduction

4,4'-oxydibenzenesulfonohydrazide is used as a chemical blowing agent in the manufacture of foam rubber and plastic products.

2. Review of Existing Data and Development of Test Plan

Crompton Corporation has undertaken a comprehensive evaluation of all relevant data on the SIDS endpoints of concern for Celogen OT. The availability of the data on the specific SIDS endpoints is summarized in Table 1. Table 1 also shows data gaps that will be filled by additional testing.

Table 1: Available adequate data and proposed testing for 4,4'-oxydibenzenesulfonohydrazide

CAS No. 80-51-3	Information Available?	GLP	OECD Study?	Other Study?	Estimation Method?	Acceptable?	SIDS Testing required?
	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N
Physicochemical							
Melting Point	Y	N			N	Y	N
Boiling Point	Y	N			N	Y	N
Vapour Pressure	Y	N			Y	Y	N
Water Solubility	Y	N			Y	Y	N
Partition Coefficient (Kow)	Y	N			Y	Y	N
Environmental Fate							
Biodegradation	Y				Y	Y	N
Hydrolysis	N						N
Photodegradation	Y				Y	Y	N
Transport and Distribution between Environmental Compartments	Y				Y	Y	N
Ecotoxicology							
Acute Fish	Y				Y	Y	N
Acute Daphnia	Y				Y	Y	N
Acute Algae	Y				Y	Y	N
Toxicology							
Acute Oral	Y	N		Y		Y	N
Repeat Dose toxicity	Y	N			N	Y	N
Genetic toxicity – Gene mutation	Y	N			N	Y	N
Genetic toxicity – Chromosome aberration	Y				N	Y	N
Reproductive toxicity	N						Y
Developmental toxicity/teratogenicity	N						Y

A. Evaluation of Existing Physicochemical Data and Proposed Testing

1. Melting Point

It is reported in a peer-reviewed publication that 4,4'-oxydibenzenesulfonohydrazide begins to decompose at 150-160°C prior to melting.

2. Boiling Point

The boiling point of 4,4'-oxydibenzenesulfonohydrazide cannot be measured as the substance decomposes prior to melting.

3. Vapour Pressure

The vapour pressure of 4,4'-oxydibenzenesulfonohydrazide was calculated to be 8.9×10^{-12} hPa at 25°C using MPBPWIN v1.40.

4. Water Solubility

The water solubility of 4,4'-oxydibenzenesulfonohydrazide was calculated to be 4733 mg/L at 25°C using WSKOW v1.40.

5. Partition Coefficient

The log Pow of 4,4'-oxydibenzenesulfonohydrazide was estimated to be 0.08 using KOWWIN v1.66.

Summary of Physicochemical Properties Testing: Existing data for melting point, boiling point, vapour pressure, water solubility and partition coefficient are considered to fill these endpoints adequately and, therefore, no further testing is planned.

B. Evaluation of Existing Environmental Fate Data and Proposed Testing

1. Biodegradation

The biodegradation of 4,4'-oxydibenzenesulfonohydrazide has been estimated using Biowin v4.00 and the results predict the substance is not readily biodegradable.

2. Hydrolysis

There are no hydrolysable groups in the chemical structure, and the substance is therefore predicted to be hydrolytically stable.

3. Photodegradation

The potential for photodegradation of 4,4'-oxydibenzenesulfonohydrazide has been estimated using AOPWIN v1.90, and indicated atmospheric oxidation via OH radicals reaction with a half-life of 61 hours.

4. Transport and Distribution between Environmental Compartments

An Epiwin Level III Fugacity Model calculation has been conducted for 4,4'-oxydibenzenesulfonohydrazide and indicates even distribution between soil and water for emissions of 1000 kg/hr simultaneously to air, water and soil compartments.

Summary of Environmental Fate Testing: Existing data for photodegradation and transport and distribution between environmental compartments are considered to fill these endpoints adequately. 4,4'-oxydibenzenesulfonylhydrazide contains no hydrolysable or biodegradable groups, therefore no hydrolysis or biodegradation testing is proposed.

C. Evaluation of Existing Ecotoxicity Data and Proposed Testing

1. Acute Toxicity to Fish

Estimation using ECOSAR v0.99g gives an LC₅₀ (96 h) of 9.76 mg/L.

2. Acute Toxicity to Algae

Estimation using ECOSAR v0.99g gives an LC₅₀ (144 h) of 2.36 mg/L.

3. Acute Toxicity to Daphnia

Estimation using ECOSAR v0.99g gives an LC₅₀ (48 h) of 17.37 mg/L.

Summary of Ecotoxicity Testing: 4,4'-oxydibenzenesulfonylhydrazide belongs to the Ecosar class of hydrazines. The predicted values for acute toxicity to fish, daphnia and algae are regarded as being valid for this material and no testing is proposed.

D. Evaluation of Existing Human Health Effects Data and Proposed Testing

1. Acute Toxicity

The acute oral toxicity has been determined to be > 5200 mg/kg b.w. The acute dermal toxicity has been determined to be > 200 mg/kg b.w. (FIFRA Section 162.8(c)). When administered by interperitoneal injection, a LD₅₀ >5000 mg/kg b.w. was observed.

2. Skin Irritation

This non-SIDS endpoint has been evaluated for Celogen OT. Slight irritation occurred in rabbits treated with an aqueous extract of the chemical.

3. Repeat Dose Toxicity

Two repeat dose toxicity studies are reported in the literature. In the first of these a NOEL of 1mg/kg bw/day (90 day, oral feed, rat) was reported. In the second study a LOAEL of 36 mg/kg/day (4 month, gavage, rat) was reported.

4. Genotoxicity

The substance was mutagenic in the Ames test (*S. typhimurium*) with and without metabolic activation and also with one strain of *Escherichia coli* with metabolic activation. With other strains of *E. coli*, the substance was found to be non-mutagenic with or without metabolic activation. The substance gave negative results in a chromosome aberration study using human lymphocytes. It also gave negative results in a micronucleus assay and UDS assay.

5. Reproductive and Developmental Toxicity

The developmental and reproductive toxicity of Celogen OT in the rat will be determined using OECD Method 421.

Summary of Human Health Effects Testing: The endpoints for developmental toxicity and reproductive toxicity (OECD 421) will be determined. The other human health endpoints have been filled adequately.

3. Evaluation of Data for Quality and Acceptability

The collected data were reviewed for quality and acceptability following the general US EPA guidance [2] and the systematic approach described by Klimisch et al [3]. These methods include consideration of the reliability, relevance and adequacy of the data in evaluating their usefulness for hazard assessment purposes. This scoring system was only applied to ecotoxicology and human health endpoint studies per EPA recommendation [4]. The

codification described by Klimisch specifies four categories of reliability for describing data adequacy. These are:

- (1) **Reliable without restriction:** Includes studies or data complying with Good Laboratory Practice (GLP) procedures, or with valid and/or internationally accepted testing guidelines, or in which the test parameters are documented and comparable to these guidelines.
- (2) **Reliable with Restrictions:** Includes studies or data in which test parameters are documented but vary slightly from testing guidelines.
- (3) **Not Reliable:** Includes studies or data in which there are interferences, or that use non-relevant organisms or exposure routes, or which were carried out using unacceptable methods, or where documentation is insufficient.
- (4) **Not Assignable:** Includes studies or data in which insufficient detail is reported to assign a rating, e.g. listed in abstracts or secondary literature.

4. References

- [1] US EPA, EPI Suite Software, 2000
- [2] USEPA (1998). Guidance for Meeting the SIDS Requirements (The SIDS Guide). Guidance for the HPV Challenge Program. Dated 11/2/98.
- [3] Klimisch, H.-J., et al (1997). A Systematic Approach for Evaluating the Quality of Experimental Toxicological and Ecotoxicological Data. Regul. Toxicol. Pharmacol. 25:1-5
- [4] USEPA (1999). Determining the Adequacy of Existing Data. Guidance for the HPV Challenge Program. Draft dated 2/10/99.

I U C L I D

Data Set

Robust Summaries

Existing Chemical : ID: 80-51-3
CAS No. : 80-51-3
EINECS Name : 4,4'-oxydi(benzenesulphonohydrazide)
EC No. : 201-286-1
Molecular Formula : C₁₂H₁₄N₄O₅S₂

Status :
Memo : Celogen OT Crompton US HPV

Printing date : 23.06.2003
Revision date :
Date of last update : 23.06.2003

Number of pages : 12

Chapter (profile) : Chapter: 1, 2, 3, 4, 5, 6, 7, 8, 10
Reliability (profile) : Reliability: without reliability, 1, 2, 3, 4
Flags (profile) : Flags: without flag, confidential, non confidential, WGK (DE), TA-Luft (DE),
Material Safety Dataset, Risk Assessment, Directive 67/548/EEC, SIDS

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2. Physico-Chemical Data

Id 80-51-3
Date 19.05.2003

2.1 MELTING POINT

Decomposition : yes, at 150 - 160 °C
Test substance : 4, 4'-oxydi(benzenesulfonohydrazide) (CAS No. 80-51-3)
Reliability : (1) valid without restriction
Peer reviewed literature

17.03.2003

(3)

2.2 BOILING POINT

Decomposition : yes
Year :
GLP :
Test substance : 4, 4'-oxydi(benzenesulfonohydrazide) (CAS No. 80-51-3)
Remark : Decomposes prior to melting

17.03.2003

(3)

2.4 VAPOUR PRESSURE

Value : .0000000000089 hPa at 25 °C
Decomposition :
Method : other (calculated): MPBPWIN v1.40
Year : 2003
GLP :
Test substance : 4, 4'-oxydi(benzenesulfonohydrazide) (CAS No. 80-51-3)

26.03.2003

(6)

2.5 PARTITION COEFFICIENT

Partition coefficient : octanol-water
Log pow : .08 at °C
pH value :
Method : other (calculated): KOWWIN v1.66
Year : 2003
GLP :
Test substance : 4, 4'-oxydi(benzenesulfonohydrazide) (CAS No. 80-51-3)
Reliability : (2) valid with restrictions

26.03.2003

(6)

2.6.1 SOLUBILITY IN DIFFERENT MEDIA

Solubility in : Water
Value : 4733 mg/l at °C
pH value :
concentration : at °C
Temperature effects :
Examine different pol. :
pKa : at 25 °C
Description :
Stable :
Deg. product :
Method : other: Calculated using WSKOW v1.40
Year :
GLP :
Test substance : 4, 4'-oxydi(benzenesulfonohydrazide) (CAS No. 80-51-3)
Reliability : (2) valid with restrictions

26.03.2003

(6)

3.1.1 PHOTODEGRADATION

Type : air
Light source :
Light spectrum : nm
Relative intensity : based on intensity of sunlight
INDIRECT PHOTOLYSIS
Half-life t1/2 : 61 hour(s)
Degradation : % after
Quantum yield :
Deg. product :
Method : other (calculated): AOPWIN v1.90
Year : 2003
GLP :
Test substance :

Remark : Concentration of hydroxyl radicals in air = 1.5E6 OH/cm3
12-hour day
Test substance : 4, 4'-oxydi(benzenesulfonohydrazide) (CAS No. 80-51-3)
Reliability : (2) valid with restrictions
26.03.2003

(6)

3.3.1 TRANSPORT BETWEEN ENVIRONMENTAL COMPARTMENTS

Type : fugacity model level III
Media :
Air : % (Fugacity Model Level I)
Water : % (Fugacity Model Level I)
Soil : % (Fugacity Model Level I)
Biota : % (Fugacity Model Level II/III)
Soil : % (Fugacity Model Level II/III)
Method : other: calculation using Epiwin Level III Fugacity Model
Year : 2003

Test condition : Henry's Law Constant: 1.26E-17 atm-m3/mole (Henrywin program)
Vapor pressure: 6.67E-12 mmHg (Mpbpwin program)
Log Kow: 0.08 (KOWWIN program)
Soil Koc: 0.493 (calc by model)
Melting point: 237 °C (MpBpwin program)

1000 kg/hr emissions to air, water and soil compartments.
Test substance : 4, 4'-oxydi(benzenesulfonohydrazide) (CAS No. 80-51-3)
Attached document : Fugacity Model Data.doc

	Mass Amount (percent)	Half-life (hr)	Emissions (kg/hr)
Air	2.35E-7	122	1000
Water	49.1	900	1000
Soil	50.8	900	1000
Sediment	0.0916	3.6E+3	0

Fugacity (atm)	Reaction (kg/hr)	Advection (kg/hr)	Reaction (percent)	Advection (percent)
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3. Environmental Fate and Pathways

Id 80-51-3
Date 19.05.2003

Air	3.52E-21	3.17E-5	5.59E-5	1.06E-6	1.86E-6
Water	2.05E-22	900	1.17E+3	30	39
Soil	7.57E-21	931	0	31	0
Sediment	1.89E-22	0.42	0.0436	0.014	0.00145

Persistence time: 793 hr
Reaction time: 1.3E+3 hr
Advection time: 2.04E+3 hr
Percent reacted: 61
Percent advected: 39

Half-lives (hr), (based upon Biowin (ultimate) and Aopwin):

Air: 122
Water: 900
Soil: 900
Sediment: 3600
Biowin estimate: 2.349 (weeks-months)

Advection times (hr):

Air: 100
Water: 1000
Sediment: 5E+4

Reliability : (1) valid without restriction
26.03.2003

(6)

3.5 BIODEGRADATION

Type : aerobic
Inoculum :
Deg. product :
Method : other: Estimation using BIOWIN v4.00
Year : 2003
GLP :
Test substance : 4, 4'-oxydi(benzenesulfonohydrazide) (CAS No. 80-51-3)
Result : MITI linear biodegradation probability = -0.466
MITI non-linear biodegradation probability = 0.000

Not Readily biodegradable
Reliability : (2) valid with restrictions
26.03.2003

(6)

4.1 ACUTE/PROLONGED TOXICITY TO FISH

Type :
Species :
Exposure period : 96 hour(s)
Unit : mg/l
LC50 : 9.76
Method : other: calculation using Ecosar v0.99g
Year : 2003
GLP :
Test substance : 4, 4'-oxydi(benzenesulfonohydrazide) (CAS No. 80-51-3)
Test condition : Log Kow: 0.08 (KowWin estimate)
Water solubility: 1.45E+5 (calculated)
Ecosar class: Hydrazines
Reliability : (2) valid with restrictions
26.03.2003

(6)

4.2 ACUTE TOXICITY TO AQUATIC INVERTEBRATES

Type :
Species : Daphnia sp. (Crustacea)
Exposure period : 48 hour(s)
Unit : mg/l
EC50 : 17.37
Method : other: calculation using Ecosar v0.99g
Year : 2003
GLP :
Test substance : 4, 4'-oxydi(benzenesulfonohydrazide) (CAS No. 80-51-3)
Test condition : Log Kow: 0.08 (KowWin estimate)
Water solubility: 1.45E+5 (calculated)
Ecosar class: Hydrazines
Reliability : (2) valid with restrictions
26.03.2003

(6)

4.3 TOXICITY TO AQUATIC PLANTS E.G. ALGAE

Species :
Endpoint :
Exposure period : 144 hour(s)
Unit : mg/l
EC50 : 2.36
Method : other: calculation using Ecosar v0.99g
Year : 2003
GLP :
Test substance : 4, 4'-oxydi(benzenesulfonohydrazide) (CAS No. 80-51-3)
Test condition : Log Kow: 0.08 (KowWin estimate)
Water solubility: 1.45E+5 (calculated)
Ecosar class: Hydrazines
Reliability : (2) valid with restrictions
26.03.2003

(6)

5. Toxicity

Id 80-51-3

Date 19.05.2003

5.1.1 ACUTE ORAL TOXICITY

Type : LD50
Value : > 5200 mg/kg bw
Species : rat
Strain : other: albino
Sex : no data
Number of animals :
Vehicle : other: olive oil
Doses : Maximum dose was 9 cc of a 14.3% solution
Method : other: United States Testing Co., Inc method
Year : 1950
GLP : no
Test substance : 4, 4'-oxydi(benzenesulfonohydrazide) (CAS No. 80-51-3)
Supplier: Naugatuck Chemical Co.
Lot No: ILGE A-2609
Purity: No data
Method : Post dose observation period: 3 days
Result : The minimum oral LD50 of a compound is the minimum dose which may be expected to kill half of the animals in a test group upon oral administration. In this study, an oral LD50 was not obtainable at the highest level fed.

The highest level fed was equivalent to 1.3g of the sample for rats weighing approximately 250 g, i.e. 5200 mg/kg.
Reliability : (2) valid with restrictions
27.03.2003 (5)

Type : LD50
Value : 2300 mg/kg bw
Species : rat
Strain :
Sex :
Number of animals :
Vehicle :
Doses :
Method : Unknown
Year : 2002
GLP :
Test substance : 4, 4'-oxydi(benzenesulfonohydrazide) (CAS No. 80-51-3)
Purity: No data
Reliability : (4) not assignable
23.06.2003 (7)

5.1.3 ACUTE DERMAL TOXICITY

Type :
Value :
Species : rabbit
Strain :
Sex :
Number of animals : 10
Vehicle : water
Doses : 200 mg/kg
Method : other: FIFRA Section 162.8 (c), March 1948
Year : 1950

5. Toxicity

Id 80-51-3

Date 19.05.2003

GLP : no
Test substance : 4, 4'-oxydi(benzenesulfonohydrazide) (CAS No. 80-51-3)
Supplier: Naugatuck Chemical Co.
Lot No: ILGE A-2609
Purity: No data
Method : The calculated dosage was first dissolved in distilled water and then placed onto gauze squares. The squares were immediately placed on the bare skin of each rabbit and securely held in place with waterproof adhesive tape. Care was taken to completely cover each patch securely so as to minimize evaporation and to insure continuous contact with the skin for 24 hours.
Result : The following observations were made after 24 hours:

1. All animals were alive and well after the 24 hour period

2. No toxic manifestations were exhibited by any of the animals under test.
Reliability : (2) valid with restrictions
27.03.2003 (5)

5.1.4 ACUTE TOXICITY, OTHER ROUTES

Type : LD50
Value : > 5000 mg/kg bw
Species : mouse
Strain :
Sex : no data
Number of animals :
Vehicle : physiol. saline
Doses : up to 2.5 c.c. of a 5% solution
Route of admin. : i.p.
Exposure time :
Method : other: United States Testing Co., Inc method
Year : 1950
GLP : no
Test substance : 4, 4'-oxydi(benzenesulfonohydrazide) (CAS No. 80-51-3)
Supplier: Naugatuck Chemical Co.
Lot No: ILGE A-2609
Purity: No data
Method : Post dose observation period: 3 days
Result : Unable to obtain a definite killing point.

The highest concentration injected was equivalent to 5000 mg/kg b.w.
Reliability : (4) not assignable
27.03.2003 (5)

5.2.1 SKIN IRRITATION

Species : rabbit
Concentration : 50 mg
Exposure :
Exposure time : 24 hours
Number of animals :
Vehicle : other
PDII :
Result :
Classification :
Method : EPA OPP 81-5
Year : 1950

5. Toxicity

Id 80-51-3

Date 19.05.2003

GLP : no
Test substance : As prescribed by 1.1-1.4
Method : 50 mg of the sample was mixed with Vaseline and placed on to gauze squares, which were then placed on the bare skin of rabbits. The squares were held in place by waterproof adhesive tape. This test was conducted on 3 rabbits. As a control the effect of pure Vaseline was tested in a similar manner. The patches were removed 24 hours later and the skin was observed for signs of irritation
Result : Slight reaction was observed in the treated rabbits and there was no irritation seen in the control
Reliability : (4) not assignable
23.07.2003 (7)

Species : rabbit
Concentration :
Exposure :
Exposure time :
Number of animals : 3
Vehicle : physiol. saline
PDII :
Result :
Classification :
Method : other: United States Testing Co., Inc method
Year : 1950
GLP : no
Test substance : 4, 4'-oxydi(benzenesulfonohydrazide) (CAS No. 80-51-3)
Supplier: Naugatuck Chemical Co.
Lot No: ILGE A-2609
Purity: No data
Method : The test substance was extracted in 5% amounts in physiological saline in an autoclave. The extracts were then injected with aseptic precautions into the rabbits. Ater 24 hours the rabbits were observed for presence of irritation.
Result : There was a slight reaction caused by the extracts of the sample.
Reliability : (4) not assignable
27.03.2003 (5)

5.4 REPEATED DOSE TOXICITY

Type :
Species : rat
Sex : male/female
Strain :
Route of admin. : oral feed
Exposure period : 90 days
Frequency of treatm. : daily
Post exposure period :
Doses : 20 ppm (1mg/kg bw/day), 2000 ppm (100 mg/kg bw/day)
Control group :
Method :
Year : 1981
GLP :
Test substance : 4, 4'-oxydi(benzenesulfonohydrazide) (CAS No. 80-51-3)
Remark : This study is limited because a restricted range of tissues of only half of any group of treated animals were subject to detailed microscopic examination.
Result : NOEL = 1 mg/kg bw/day

5. Toxicity

Id 80-51-3

Date 19.05.2003

Groups of 12 rats of each sex fed diets containing 2000 ppm (100 mg/kg bw/day) for 90 days showed reduced food consumption and depressed growth, and two of the male rats died within 10 weeks appearing malnourished. Increased liver and kidney weights were noted, but no macroscopic abnormalities or effects on the blood were seen in the surviving animals. These findings were attributed by the investigators to the low palatability of the diet. No effects were observed in animals fed 20 ppm (1 mg/kg bw/day).

Reliability : (4) not assignable
16.05.2003 (1)

Type :
Species : rat
Sex :
Strain :
Route of admin. : gavage
Exposure period : 4 months
Frequency of treatm. : daily
Post exposure period :
Doses :
Control group :
LOAEL : 36 mg/kg bw
Method :
Year : 1969
GLP :
Test substance : 4, 4'-oxydi(benzenesulfonohydrazide) (CAS No. 80-51-3)
Result : Doses of approximately 200 mg/kg bw/day by stomach tube killed all six rats within 2 weeks. Growth was reduced in six rats given 36 mg/kg bw/day by stomach tube for 4 months. Increased liver weight, disturbance of liver and kidney function and changes in the appearance of the liver, kidney and adrenals were also seen.

Reliability : (4) not assignable
16.05.2003 (4)

5.5 GENETIC TOXICITY 'IN VITRO'

Type : Chromosome aberration test
System of testing :
Test concentration :
Cycotoxic concentr. :
Metabolic activation :
Result : Negative

The results indicate that the test substance did not cause a statistically significant increase in the number of chromosome aberrations ($p < 0.05$). This was observed for both activated and non-activated systems. In addition, there was no detectable dose response in the number of aberrations of both activated and non-activated systems, verifying the validity of the test system. In conclusion, the test substance did not induce chromosomal aberrations in Primary Cultured Human Lymphocytes and is considered non-clastogenic

5. Toxicity

Id 80-51-3

Date 19.05.2003

Method	: The test substance was evaluated for its ability to induce chromosomal aberrations in primary human lymphocyte cells in the presence and absence of a rat liver homogenate metabolic activation system. The test article was tested at the following concentrations: Neat and 1:2, 1:4, 1:8, 1:16, 1:32 and 1:64 dilutions of the neat extract. The concentrations chosen to be scored for the activated assay were Neat and 1:2 and 1:4 dilutions of the test extract. The following controls were used: 1. Negative Control Article:- RPMI Cell Culture medium, the extraction vehicle, served as the negative control article. 2. Positive Control Article (Non-activated system):- Mitomycin C (MMC) is a known mutagen and clastogenic agent and served as the positive control article for the non activation system. 3. Positive Control Article (Activated System):- Cyclophosphamide (CP) is a clastogen that requires metabolic transformation by microsomal enzymes. It served as the positive control article for the activation assay
Year	: 1997
GLP	:
Test substance	: 4, 4'-oxydi(benzenesulfonohydrazide) (CAS No. 80-51-3) Purity: no data
Reliability 23.06.2003	: (4) not assignable
	(7)
Type	: Bacterial reverse mutation assay
System of testing	:
Test concentration	: Neat, 1:2, 1:4, 1:8 and 1:20 fold dilutions.
Cycotoxic concentr.	:
Metabolic activation	: +/-
Result	: Positive
Method	: EPA OTS 798.5265
Year	: 1997
GLP	: Yes
Test substance	: 4, 4'-oxydi(benzenesulfonohydrazide) (CAS No. 80-51-3) Purity: no data
Method	: The Salmonella typhimurium Reverse Mutation Assay (Ames Assay) test was conducted to evaluate the potential for the test substance to induce histidine reversion caused by base changes or frameshift mutations in the genome of this organism. The direct plate incorporation assay was conducted with four strains of Salmonella typhimurium in the presence and absence of exogenous mammalian activation system.
Result	: The test substance is mutagenic.
Reliability 23.06.2003	: (4) not assignable
	(7)
Type	: Bacterial reverse mutation assay
System of testing	:
Test concentration	:
Cycotoxic concentr.	:
Metabolic activation	:
Result	: positive
Method	:
Year	:
GLP	:
Test substance	: 4, 4'-oxydi(benzenesulfonohydrazide) (CAS No. 80-51-3) Purity: no data
Remark	: 4,4'-Oxybis(benzenesulphonyl hydrazide) was mutagenic in Salmonella typhimurium (Ames test) in the presence or absence of a liver metabolic activation system (Hachiya, 1987; Shimizu, 1986; Shimizu et al, 1978). In a test with one strain of Escherichia coli, a liver metabolic activation system

5. Toxicity

Id 80-51-3
Date 19.05.2003

was required for the hydrazide to exhibit mutagenic potential (Shimizu, 1986), although tests with other strains (Hachiya, 1987; Shimizu, 1986), found no evidence of mutagenicity in the presence or absence of a liver metabolic fraction.

Reliability : (4) not assignable
16.05.2003 (2)

5.6 GENETIC TOXICITY 'IN VIVO'

Type : Micronucleus assay
Species :
Sex :
Strain :
Route of admin. :
Exposure period :
Doses :
Result : Negative
Method :
Year :
GLP :
Test substance : 4, 4'-oxydi(benzenesulfonohydrazide) (CAS No. 80-51-3)
Purity: no data
Reliability : (4) not assignable
23.06.2003 (7)

Type : Unscheduled DNA synthesis
Species :
Sex :
Strain :
Route of admin. :
Exposure period :
Doses :
Result : Negative
Method :
Year :
GLP :
Test substance : 4, 4'-oxydi(benzenesulfonohydrazide) (CAS No. 80-51-3)
Purity: no data
Reliability : (4) not assignable
23.06.2003 (7)

5.8.1 TOXICITY TO FERTILITY

5.8.2 DEVELOPMENTAL TOXICITY/TERATOGENICITY

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- (2) Hachiya, N. (1987). Akita J. Med. 14 269; Shimizu, H. (1986). Tokyo Jikeika med. J. 101, 167; Shimizu, H. et al (1978) Jpn J. Hygiene 33, 474; reported in BIBRA International Ltd (1997). Toxicity Profile for 4,4'-Oxybis(benzenesulphonylhydrazide)
- (3) Hawley, G.G., The Condensed Chemical Dictionary, 9th ed., New York, Nostrand Rheinhold Co., p 643, 1977
- (4) Shurupova, G.A., et al (1969). Sin. Issled Eff. Khimikatov. Polim. Mater. 3, 438; reported in BIBRA International Ltd (1997). Toxicity Profile for 4,4'-Oxybis(benzenesulphonylhydrazide)
- (5) United States Testing Company, Inc, Test Report 21672, July 21, 1950
- (6) US EPA, EPIWIN v3.10, EPI Suite Software, 2000
- (7) IUCLID Dataset for Existing Chemicals, 4, 4'-oxydi(benzenesulfonohydrazide), 2002